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F4X XA2B1 XA2D XA2E  
B3C C1B1

(56) Documents Cited  
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GB 1431353 A EP 0426321 A1 US 5467835 A  
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(58) Field of Search  
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INT CL<sup>6</sup> B08B 15/04 , B23B 45/00 47/34 , B23Q 11/00  
ONLINE : WPI

(54) Abstract Title  
**Universal power tool vacuum cleaner & adaptor**

(57) All power tool motors are cooled via ventilation slots. The Universal Adaptor uses these slots to grip itself onto the motor.

The Universal Adaptor is a clamp, which allows movement (up/down, side/side and in/out), of the legs, which will locate onto any power tool ventilation slots.

The legs attach to runner blocks, which move around a ring. The ring carries the vacuum unit and gearbox.

The drive for the vacuum unit is via a drive coupling connected to the power tool motor.

The vacuum system incorporates a gearbox vacuum pump, dust bag (for debris collection), a dustpan (with a magnet for metallic debris collection). Sturdy flexible pipework is used between the components.

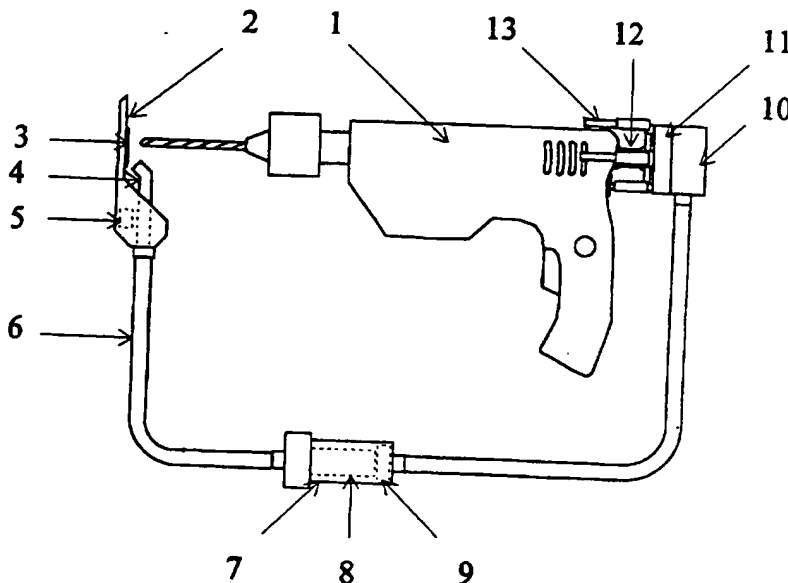


fig 1

GB 2 344 648 A

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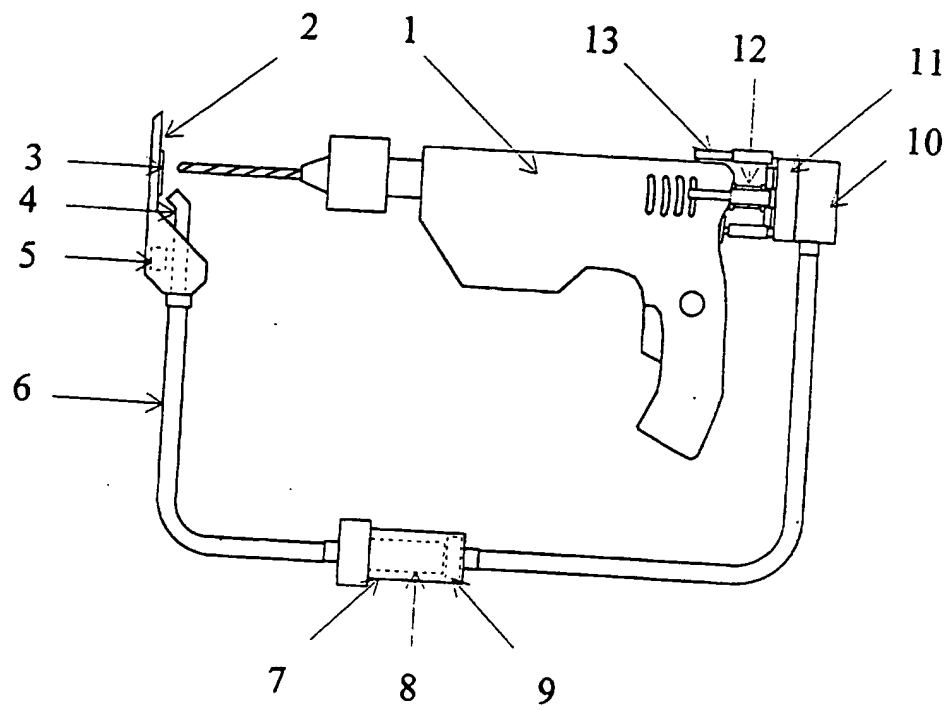


fig 1

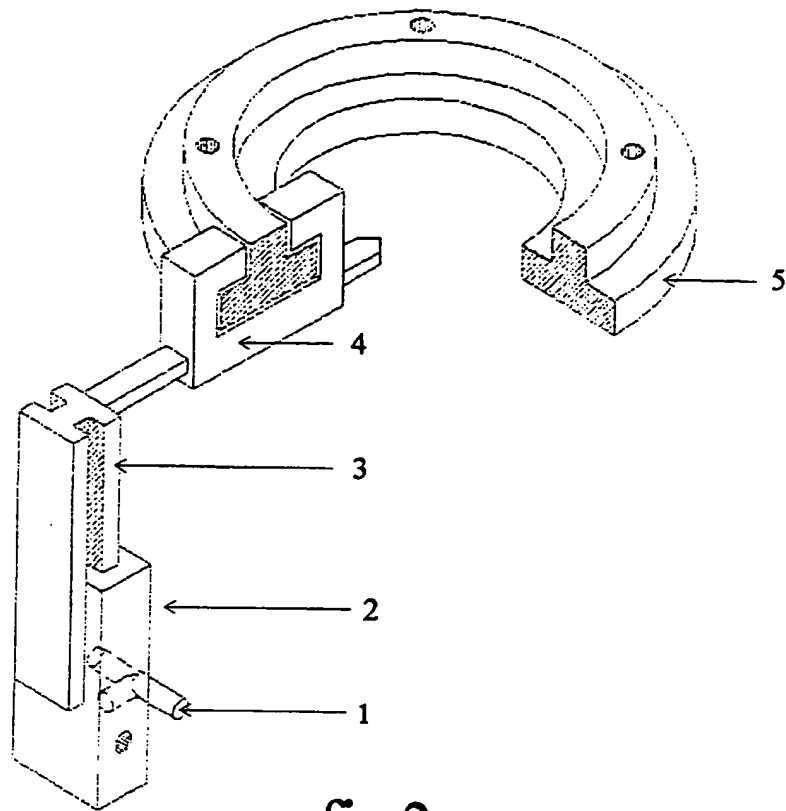


fig 2

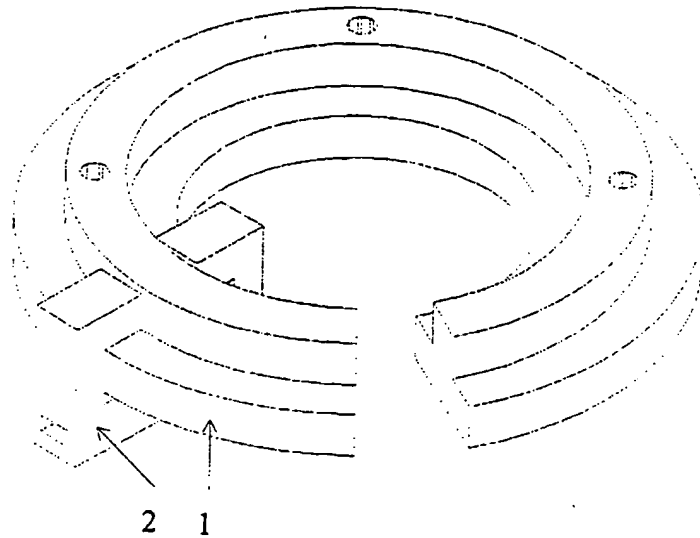


fig 3

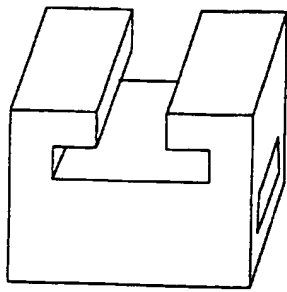


fig 4

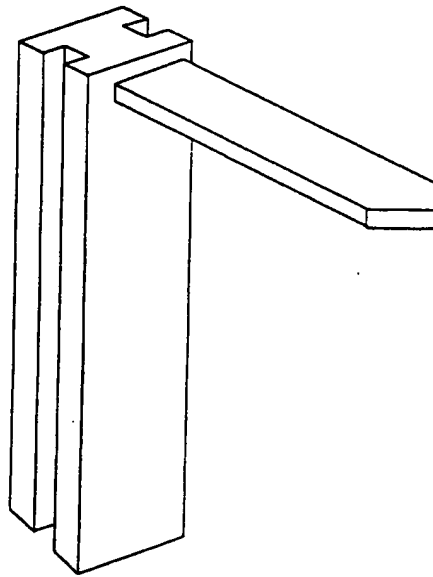


fig 5

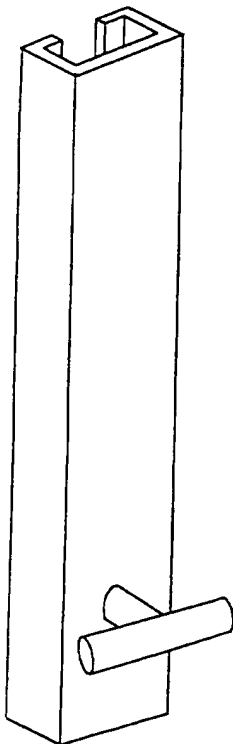


fig 6

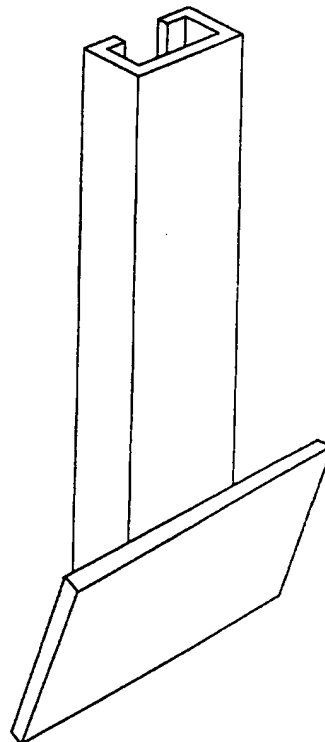


fig 7

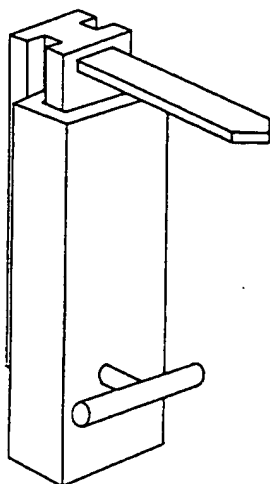


fig 8

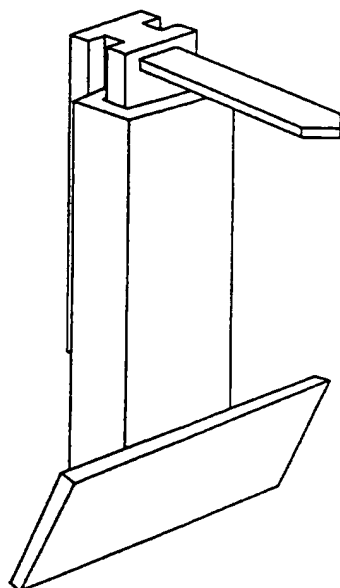


fig 9

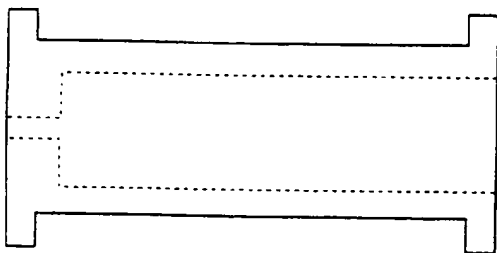


fig 10

## DESCRIPTION

### THE UNIVERSAL POWER TOOL ADAPTOR AND VACUUM CLEANER ASSEMBLY

The Universal Power Tool Adaptor is an adjustable clamp that is specifically designed to carry a vacuum cleaning system.

The vacuum source for the cleaning system is a vacuum pump with a gearbox.

Drive from the power tool commutator driveshaft is transferred to the vacuum source drive shaft by a coupling.

The Universal Power Tool Adaptor has special legs which when used with sliding blocks and a clamping ring, gives adjustment in the following directions (up/down, in/out, side/side).

Each leg splits into three sections.

- (i) Tee piece..... (This grips onto the power tool motor air cooling slots).
- (ii) Lower leg section (A).... (This section is moulded to a C shape, and at its bottom it carries the T piece as previously described)
- (iii) Lower leg section (B).... (This section is moulded to a C shape, and at its bottom it carries a wide flat plate, this plate is used to rest against power tool handles to give greater stability to the clamping arrangement. This section is not always used.
- (iv) Upper leg section.... (This section is moulded to an H shape, and at its top it carries a flat, long blade; this is used to connect the leg assembly to a sliding block fitted to the clamping ring.

The upper & lower leg sections are designed to slide together (this allows adjustment to be made up/down).

The sliding blocks are designed with a similar cutout to the clamping ring section, so that they can move around the clamping ring, even when the ring is secured to the vacuum assembly. (This allows adjustments to be made side/side). Another design of the block is a slot to allow the long, flat blade of the upper leg section, to slide through. (This allows adjustment in/out).

Each leg assembly connects to a clamping ring by means of a sliding block, up to six block/leg assemblies can fit onto the clamping ring.

The clamping ring is a moulded ring which has a raised section incorporated in the design of the ring. This is used to convey the sliding blocks.

The clamping ring has a cutout in it to allow the sliding blocks to be fitted onto the ring. The clamping ring is secured to the vacuum source.

A drill has been selected to illustrate all of the components used in the vacuum system (fig 1).

- 1 Drill
- 2 Dustpan
- 3 A flap
- 4 Removable suction pipe
- 5 A magnet (for swarf removal)
- 6 Flexible/stiff tubing
- 7 Dustbag capsule
- 8 Dustbag
- 9 Filter
- 10 The vacuum unit
- 11 Gearbox
- 12 Drive coupling
- 13 Universal adaptor assembly

The Universal Adaptor is drawn as a unit (see fig 2). Note that up to six legs could be used.

- 1 Tee piece
- 2 Lower leg section A
- 3 Upper leg section
- 4 Sliding block
- 5 Clamping ring

The Clamping ring (see fig 3).

- 1 Clamping ring
- 2 Sliding block

Sliding block is shown (see fig 4).

Upper leg section is shown (see fig 5).

Lower leg section type A is shown (see fig 6).

Lower leg section type B is shown (see fig 7).

A combination of upper and lower type A legs is shown (see fig 8).

A combination of upper and lower type A legs is shown (see fig 8).

A combination of upper and lower type B legs is shown (see fig 9).

The vacuum unit drive coupling is shown (see fig 10).



## CLAIMS

- 1     The Universal Adaptor carries a vacuum unit and gearbox assembly.
- 2     The Universal Adaptor is adjustable to suit any power tool motor.
- 3     The Universal Adaptor grips onto the air cooling vents used on power tool motors.
- 4     The drive for the vacuum system is transferred from the power tool motor by means of a coupling.
- 5     The legs upper leg sections used for the Universal Adaptor are available in two designs, both designs are not always required to grip onto a power tool, usually one is sufficient.
- 6     The forthcoming text and drawings will completely describe my invention.

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Application No: GB 9827459.0  
Claims searched: 1 at least

Examiner: Paul Gavin  
Date of search: 5 February 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK Cl (Ed.Q): F4X,B3C  
Int Cl (Ed.6): B08B(15/04), B23B(45/00,47/34),B23Q(11/00)  
Other: Online : WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 1 602 623 (OTTO BAIER)- consider whole document	1 at least
X	GB 1 561 581 (BOSCH) - consider whole document	1 at least
X	GB 1 527 523 (LECHNER) - consider whole document	1 at least
X	GB 1 431 353 (HIRDES) - consider whole document	1 at least
X	EP 0 426 321 A1 (HITACHI) - consider whole document	1 at least
X	US 5 467 835 (HILTI) - consider whole document	1 at least
X	US 5 199 501 (HILTI) - consider whole document	1 at least
X	US 4 209 069 (LOCKHEED) - consider whole document	1 at least

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